Mitigation Measure	Implementation	Timing
BIO-2o: Protection of Steelhead Migratory Habitat - The proposed College Lake with Inland Pipeline to Coastal Distribution System component shall be operated such that it complies with all minimum required bypass flow requirements during the steelhead migration period.	Right holder	Ongoing
BIO-2p: The PVWMA shall install and operate surface-water streamflow gaging stations on Casserly Creek upstream and on Salsipuedes Creek downstream of the proposed College Lake diversion structure to monitor available diversion inflows and to provide required fish bypass flows.	Right holder	Ongoing
BIO-3a: Occurrences of special status plant species shall be avoided by project construction activities to the extent feasible. All facilities and construction activities will be maintained outside habitats supporting special status plant species where feasible. Prior to construction, a qualified biologist will conduct a survey of the project area to ascertain the presence or absence of special status plant species. If no species are encountered, no mitigation is required. If a special status species is found within a BMP Update component project area, a setback of 50 feet will be established between the occurrence and the BMP Update construction activities. Prior to construction, PVWMA will install temporary construction fencing at the 50-foot setback line to prevent inadvertent equipment access or construction staging within the special status plant habitat. This fencing will be signed in the field as "SENSITIVE HABITAT AREA - NO CONSTRUCTION ACCESS". A qualified biologist will inspect the temporary construction barrier fence and monitor the contractor's compliance with this avoidance measure. If complete avoidance of special status plant species is infeasible, impacts would be minimized through implementation of Mitigation Measure BIO-3b.	Right holder	Pre-Construction and Construction
BIO-3b: Prior to clearing and grubbing in areas where impacts to special status plant species cannot be avoided, PVWMA will consult with applicable resource agencies (i.e., CDFW and/or USFWS) prior to implementing	Right holder, CDFW, USFWS	Ongoing

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Mitigation Measure	Implementation	Timing
salvage and revegetation actions. A qualified biologist will collect any available above- ground seed pods/seed heads for their use in future revegetation efforts. During construction, the upper 6 inches of topsoil from areas supporting the plant species will be stripped from the construction area and stored for later use. The topsoil will be used in future revegetation efforts which may be on-site (if feasible) or at an off-site location approved by permitting agencies (i.e., USFWS, CDFW). At the designated revegetation area, all stockpiled topsoil will be placed on site and finish graded to blend with surrounding topography. Under direction of a qualified biologist, the areas will be revegetated with locally native herbaceous plant species compatible with natural regeneration of the special status plant species. The qualified biologist will hand broadcast any seeds collected from the special status plant species into the appropriate habitat areas. The revegetation will achieve a minimum of 2:1 plant replacement (i.e., re-establish two plants for every plant impacted). The qualified biologist will monitor the revegetation areas for two years after construction to ascertain if the special status plant species re-established within the revegetation area. Annual reports will be submitted to permitting agencies by December 31 of each monitoring year, describing the results of the revegetation measures, for a period of 5 years.		

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BR-1a: Fish Relocations

Prior to, or concurrent with, draining of College Lake and/or dewatering of the construction site, special-status and other native fish species shall be captured and relocated by a qualified fisheries biologist. The following measures shall be taken to minimize harm and mortality to steelhead and other native fish resulting from fish relocation and dewatering activities:

- 1. Fish relocation shall be performed by a qualified fisheries biologist, with all necessary state and federal authorizations. Captured fish shall be moved to the nearest appropriate site outside of the work area. A record of relocation activities shall be maintained and include the date of capture and relocation, the method of capture, the location of the relocation site in relation to the Project site, and the number and species of fish captured and relocated;
- 2. Electrofishing shall be conducted by properly trained personnel following NOAA Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act, June 2000.
- 3. Prior to capturing fish, the most appropriate release location(s) shall be determined.
- 4. The most efficient method for capturing fish shall be determined by the biologist. Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.
- 5. Handling of salmonids shall be minimized. However, when handling is necessary, hands or nets shall be wetted prior to touching fish.
- 6. Captured fish shall be held in cool, shaded, aerated water in a container with a lid. Aeration shall be provided with a battery-powered external bubbler. Fish shall be protected from jostling and noise, and shall not be removed from this container until time of release.

Right holder

Pre-Construction and Construction

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Mitig	ation Measure	Implementation	Timing
7.	Air and water temperatures shall be measured periodically. A thermometer shall be placed in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds 18 degrees Celsius, fish shall be released and rescue operations ceased, if feasible.		
8.	Overcrowding in containers shall be avoided by having at least two containers and segregating young-of-year fish from larger age-classes to avoid predation. If fish are abundant, the capturing of fish and amphibians shall cease periodically and shall be released at the predetermined locations.		
9.	Species and year-class of fish shall be visually estimated at time of release. The number of fish captured shall be counted and recorded. Anesthetization or measuring fish shall be avoided unless requested by appropriate resource agencies (National Marine Fisheries Service (NMFS), CDFW).		
10	Fish relocation activities are typically restricted to the period of June 15 through November 1. However, draining of College Lake may have to commence prior to June 1 to ensure the lake is fully drained prior to the start of construction. If lake draining commences prior to June 1 (as it regularly does under existing conditions), fish relocations would be timed accordingly. Given that steelhead present at the time of draining are likely to be smolts attempting to reach the ocean, pre-June 1 relocations concurrent with lake draining would ensure suitable downstream passage conditions and timing for relocated smolts.		

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BR-1b: Frac-out Contingency Plan

If horizontal directional drilling (HDD) installation is implemented, PV Water shall require the contractor to retain a licensed geotechnical engineer to develop a Frac-out Contingency Plan. PV Water would submit the Frac-out Contingency Plan to the appropriate resource agencies (CDFW, RWQCB, USACE, USFWS, and NMFS) for review prior to the start of construction of any pipeline that would use HDD installation to avoid surface waters. The Frac-out Contingency Plan shall be implemented where HDD installation under a waterway will occur to avoid, minimize, or mitigate for potential Project impacts during HDD installation, as specified in the Frac-out Contingency Plan. The Frac-out Contingency Plan shall include, at a minimum:

- Measures describing training of construction personnel about monitoring procedures, equipment, materials and procedures in place for the prevention, containment, clean-up (such as creating a containment area and using a pump, using a vacuum truck, etc.), and disposal of released bentonite slurry, and agency notification protocols;
- 2. Methods for preventing frac-out including maintaining pressure in the borehole to avoid exceeding the strength of the overlying soil.
- 3. Methods for detecting an accidental release of bentonite slurry that include: (a) monitoring by a minimum of one biological monitor throughout drilling operations to ensure swift response if a frac-out occurs; (b) continuous monitoring of drilling pressures to ensure they do not exceed those needed to penetrate the formation; (c) continuous monitoring of slurry returns at the exit and entry pits to determine if slurry circulation has been lost; and (d) continuous monitoring by spotters to follow the progress of the drill bit during the pilot hole operation, and reaming and pull back operations.

Right holder, CDFW, RWQCB, USACE, USFWS, and NMFS

Pre-construction

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Mitigation Measure	Implementation	Timing
to a minimum and aggressive monitoring of WPTs before vegetation removal and during the construction and revegetation phase.		
WPT-1. PV Water will annually submit the name(s) and credentials of biologists who would conduct activities specified in the following measures. No project activities will begin until proponents have received approval from CDFW that the biologist(s) is qualified to conduct the work.		
WPT-2. A CDFW-approved biologist will survey the work site 48 hours prior to the onset of construction or maintenance activities. If WPT adults or juveniles are found, the approved biologist will determine the closest appropriate relocation site. The approved biologist will be allowed sufficient time to move them from the work site before work activities begin. Only CDFW-approved biologists will participate in activities associated with the capture, handling, and moving of WPT. If WPT eggs or nests are found, no work will be conducted within a 50-foot radius of the nest. Work can resume within the 50-foot radius once the eggs hatch and the juveniles have left the area.		
WPT-3. Before any construction or maintenance activities begin on a project, a CDFW-approved biologist will conduct a training session for all construction personnel. At a minimum, the training will include a description of the WPT and its habitat, the importance of the WPT and its habitat, general measures that are being implemented to conserve the WPT as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.		
WPT-4. A CDFW-approved biologist will be present at the construction or maintenance site until such time as all removal of WPT, instruction of workers, and disturbance of habitat have been completed.		

Mitigation Measure	Implementation	Timing
WPT-5. The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the project plans. Routes and boundaries will be clearly demarcated. Where impacts occur in these staging areas and access routes, restoration will occur as identified in the general best management practices measures above.		
BR-2: Invasive Fish Species Control Plan		
PV Water shall develop an Invasive Fish Species Control Plan. PV Water shall submit the plan to the appropriate resource agencies (CDFW, USFWS, and NMFS) for approval within one year of Project implementation. The Fish Species Control Plan shall be implemented at College Lake within two years of Project implementation. The Fish Species Control Plan shall include, at a minimum: 1. Measures describing PV Water's methods of draining College Lake to the greatest extent feasible; 2. Measures describing PV Water's methods, equipment, and timing of invasive species eradication efforts to be conducted in association with lake drawdown efforts; 3. Measures describing the frequency at which invasive species control efforts are to be implemented.	Right holder, CDFW, USFWS, and NMFS	Ongoing
Geology and Soils		
GS-1: Future construction of proposed BMP Update facilities shall be designed in accordance with design recommendations of geotechnical reports and in compliance with applicable policies and appropriate engineering investigation practices necessary to reduce the potential detrimental effects of ground shaking and liquefaction. Construction shall be	Right holder	Pre-construction

Mitigation Measure	Implementation	Timing
in accordance with applicable requirements regarding mitigation of seismic and geologic hazards, and appropriate geotechnical studies shall be conducted.		
GS-2: Construction of future BMP Update facilities shall include preparation and implementation of erosion control plans to minimize erosion and inadvertent transport of sediments into water bodies during installation of facilities. Measures shall include, but not be limited to: limiting the area of ground disturbance and vegetation removal at any one time during construction; conducting work prior to the rainy season if possible and protecting disturbed areas during the rainy season; installing bales or other appropriate barriers adjacent to water bodies to prevent transport of sediments into sloughs and water courses; immediately revegetating disturbed areas; and other Best Management Practices during construction to protect water quality. All grading and construction shall conform to applicable requirements.	Right holder	Pre-construction and Construction
GS-3: All diversion and pipeline facilities shall be designed and engineered in accordance with recommendations of a geotechnical report and appropriate engineering designs to reduce the potential detrimental effects of expansive soils, corrosivity, and/or other identified soils constraints. A licensed geotechnical engineer shall prepare recommendations applicable to foundation design, earthwork, and site preparation prior to or during the project design phase. Recommendations will address mitigation of site-specific, adverse soil and bedrock conditions that could hinder development. Project engineers shall implement the recommendations. Geotechnical design and design criteria will comply with applicable codes and requirements of the California Building Code (CCR Title 24).	Right holder	Pre-construction

Mitigation Measure	Implementation	Timing
HM-1: Prior to initiation of earthwork activities, PVWMA shall perform soil testing on agricultural sites proposed for development and analytically test for pesticide residuals and pesticide-related metals arsenic, lead, and mercury. If contamination is identified in the soil samples above applicable levels, PVWMA shall prepare a Site Management Plan (SMP) to establish protocols/guidelines for the contractor including: identification of appropriate health and safety measures while working in contaminated areas; soil reuse; handling, and disposal of any contaminated soils; and agency notification requirements. The SMP shall be subject to the review and approval of the appropriate regulatory agency.	Right holder	Pre-construction
HM-2: Prior to initiation of earthwork activities on properties along the College Lake pipeline alignment not sampled as part of adopted Mitigation Measure HM-1, PV Water shall perform a Phase I Environmental Site Assessment for the alignment to determine the potential for encountering hazardous materials contamination in soils to be excavated and identify appropriate recommendations. Appropriate health and safety measures shall be identified as needed for worker safety, soil handling, and disposal of contaminated soils.	Right holder	Pre-construction and construction
HAZ-1a: Health and Safety Plan (HASP)		
Using information from the soil testing performed as part of adopted Mitigation Measure HM-1 and from the Phase I Environmental Site Assessment performed as part of adopted Mitigation Measure HM-2, PV Water shall require the construction contractor(s) to prepare and implement a site-specific HASP in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. The HASP shall include, but is not limited to, the following elements:	Right holder	Pre-construction and Construction

Mitig	gation Measure	Implementation	Timing
1.	Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site HASP;		
2.	A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals based on the most recent data collection and reporting;		
3.	Specified personal protective equipment and decontamination procedures, if needed;		
	Emergency procedures, including route to the nearest hospital; and Procedures to be followed in the event that evidence of potential soil or groundwater contamination (such as soil staining, noxious odors, debris or buried storage containers) is encountered.		
HAZ-	1b: Soil Management Plan (SMP)		
Mitigate Assess Water mater remove approximation worker noxioo by a contract well as a co	information from the soil testing performed as part of adopted ation Measure HM-1 and from the Phase I Environmental Site assment performed as part of adopted Mitigation Measure HM-2, PV or or its contractor shall develop and implement an SMP that includes a rials disposal plan specifying how the construction contractor shall we, handle, transport, and dispose of all excavated material in a safe, opriate, and lawful manner. The plan shall identify protocols for training ers to recognize potential soil contamination (such as soil staining, us odors, debris or buried storage containers), soil testing and disposal qualified contractor in the event that contamination is identified, and fication of approved disposal sites (e.g., approved landfill or reuse site), act specifications shall mandate approval of the SMP by PV Water as as full compliance with all applicable local, state, and federal regulations and to the identification, transportation, and disposal of hazardous rials.	Right holder	Pre-construction and Construction

Mitigation Measure	Implementation	Timing
Surface Water, Groundwater, and Water Quality		
HWQ-1: PVWMA shall require contractors to apply for all applicable NPDES permits, including dewatering permits, develop a Stormwater Pollution Prevention Plan (SWPPP) for construction of proposed facilities, and comply with conditions of the permit(s), as required by the RWQCB. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of stormwater discharge and to implement Best Management Practices to reduce pollutants in stormwater discharges. The SWPPP for this proposed action would include the implementation, at a minimum, of the following elements:		
 Source identification Preparation of a site map Description of construction materials, practices, and equipment storage and maintenance List of pollutants likely to contact stormwater Estimate of the construction site area and percent impervious area Erosion and sedimentation control practices, including soils stabilization, revegetation, and runoff control to limit increases in sediment in stormwater runoff, such as detention basins, straw bales, silt fences, check dams, geofabrics, drainage swales, and sandbag dikes Proposed construction dewatering plans Provisions to eliminate or reduce discharge of materials to stormwater Description of waste management practices Maintenance and training practices 	Right holder, RWQCB	Pre-construction

Mitigation Measure	Implementation	Timing
HWQ-2: Rapid, imposed water-level fluctuations shall be avoided within the sloughs, Salsipuedes Creek, and the Pajaro River to minimize erosion and failure of exposed (or unvegetated), susceptible banks. This can be accomplished by operating the pumps at an appropriate flow rate, in conjunction with commencing operation of the pumps only when suitable water levels or flow rates are measured in the water body. Criteria for minimizing fluctuations and/or protecting banks from related erosion will need to be developed, as some banks presently are stable and others are not. Control is important, as the mobilized sediment also impairs in-slough habitat values, and potentially exacerbates bacterial levels in the slough system. It may be that water-level fluctuations may be controlled as well to minimize other impacts, such as desiccation of amphibian eggs or waterlogging of agricultural soils adjacent to the sloughs.	Right holder	Ongoing
HWQ-3: If pumping rates in existing wells fall below levels that can support existing or planned land uses, and the reduction in pumping can be attributed to one or many of the project components, then one of several measures may be undertaken to mitigate the loss of pumping. These mitigation measures may include:		
 Improving irrigation efficiency Modifying irrigation and agricultural operations Lowering the pump in the irrigation well Lowering and changing the pump in the irrigation well Adding storage capacity for irrigation supply Replacing the irrigation well Replacing the irrigation water source 	Right holder	Ongoing
To determine if well production loss can be attributed to one of the project components, the PVWMA will allow well owners to enroll in a monitoring and mitigation program (MMP). PVMWA will collect baseline data necessary for		

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Mitigation Measure	Implementation	Timing
establishing significant impacts only from wells that are enrolled in the MMP. If a well is not enrolled in the MMP, to claim a significant impact the well owner will need to provide adequate and reliable baseline data. To claim a significant impact for each well enrolled in the MMP, PVWMA will first establish baseline irrigation well extraction rates, drawdowns, and water quality near planned components. Pumping rate reductions and changes in water quality from these baseline values will be analyzed to assess whether or not they are caused by the project. A pumping rate reduction or adverse change in water quality is assumed to be caused by the Project if: 1) it occurs at the same time as the onset of operations of BMP Update component(s); 2) it occurs in an area reasonably predicted to be affected by the BMP Update component(s); 3) static groundwater levels have dropped; 4) pumping groundwater levels have not dropped more than static groundwater levels; and 5) no other obvious reason exists for the drop in production capacity. For PVWMA or others to identify another reason for loss of production it must be based on the written professional opinion of a qualified hydrogeologist that will be submitted to the PVWMA staff or their designee, for review and concurrence.		
HWQ-4: Facilities shall be designated to comply with Federal Emergency Management Agency (FEMA) and County of Santa Cruz requirements to floodproof the facilities and shall not exacerbate upstream or downstream flood hazards on other properties. The FEMA process will require identification of the FEMA floodway zone and may require no increase water elevations for a one percent chance annual flood. The FEMA process will require identification of the FEMA zone type and may require no increase water elevations for a one percent chance annual flood. To meet the specific FEMA requirements for the component, substantial modifications to the facility design and additional mitigation may be required.	Right holder	Pre-construction

Mitig	ation Measure	Implementation	Timing
	1: Implement Dewatering Best Management Practices for In-Water truction.		
requir shall i Salsip be tim measi shall r	e its contractor(s) to prepare a Dewatering Plan. The Dewatering Plan dentify best management practices that ensure construction activities at puedes and Pinto Creeks meet water quality objectives. This work shall led to take place as flows are receding and only after instream ures to reduce downstream turbidity are in place. In addition, PV Water require its contractors to implement the measures below, and water y protection measures required by the RWQCB.		
1.	All work performed in-water shall be completed in a manner that meets the water quality objectives to ensure the protection of beneficial uses as specified in the 2017 Basin Plan.		
2.	All dewatering and diversion methods shall be installed such that natural flow is maintained upstream and downstream of the Project area.	Right holder	Pre-Construction and Construction
3.	Any temporary dams or diversion shall be installed such that the diversion does not cause sedimentation, siltation, or erosion upstream or downstream of the Project area.		
4.	Screened pumps shall be used in accordance with CDFW's fish screening criteria and in accordance with the NMFS Fish Screening Criteria for Anadromous Salmonids and the Addendum for Juvenile Fish Screen Criteria for Pump Intakes.		
5.	Cofferdams shall remain in place and functional throughout the instream construction.		
6.	Disturbance of protected riparian vegetation shall be limited or avoided entirely.		

Mitigation Measure	Implementation	Timing
HYD-2a: Water Quality Adaptive Management for College Lake		
To learn about potential impacts of the Project on College Lake water quality and the quality of downstream water bodies, PV Water shall monitor College Lake water for indications of Cyanobacteria blooms. When the proposed weir crest is elevated to 62.5 feet NAVD88, PV Water shall monitor College Lake water temperature within the water column to establish whether a thermocline develops. PV Water shall use results of this monitoring to support the development of the Adaptive Management Plan that establishes management actions to minimize the conditions that can contribute to algal blooms, including cyanobacteria blooms, such that this impact is mitigated.	Right holder	Ongoing
HYD-2b: Scour Analysis for Pinto Creek Crossing		
To reduce Project impacts on erosion and sedimentation, PV Water shall evaluate the potential for scour and channel bank erosion due to the Pinto Creek pipeline crossing. The analysis shall recommend a design depth for the pipeline crossing that avoids scour, estimated using standard engineering methods. PV Water shall implement the pipeline depth that avoids scour in final project design.	Right holder	Pre-construction
HYD-3: Avoid Flooding at Pajaro Dunes During Pumped Flow		
PV Water shall not pump flow exceeding fish passage requirements into Salsipuedes Creek until receiving approval from the Santa Cruz County Flood Control District indicating that pumped flow can occur without lagoon breaching, based on current water surface elevation conditions in Pajaro Lagoon. Existing hypsometric curves will be used to develop a lookup table to relate capacity of College Lake and Pajaro Lagoon that will assess whether pumped flows would require lagoon breaching. PV Water pumped flows shall not result in lagoon water surface elevations exceeding the threshold elevation identified based on the lookup table. The College Lake operations	Right holder, Santa Cruz County Flood Control District	Ongoing

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Mitigation Measure	Implementation	Timing
plan will discuss scenarios where lake draining activities may supersede lagoon flooding and breaching activities.		